

Developing a Shared Model for Sustainable Aboriginal Livelihoods in Natural-Cultural Resource Management

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EXTENDED ABSTRACT

Through long-established connections to country, Aboriginal residents are highly committed to sustaining the many natural and cultural values embodied in arid Australia. Many of these lands are in better ecological condition than those in other biomes and provide important conservation opportunities. However, equitable land management partnerships and goals are rarely sustained in large part because there is no widely-accepted planning and evaluation framework to bridge the significant cultural differences in concepts such as land, livelihoods in land, outcomes of livelihood strategies, and sustainable governance of this system across levels.

In this context, CSIRO Sustainable Ecosystems is working through the Desert Knowledge Cooperative Research Centre's *Livelihoods inLand*TM project on cross-cultural participatory modelling of desert Aboriginal livelihoods in land management. This research is examining:

1. evidence for the relationship between natural and cultural resource management and sustainable livelihood outcomes for desert people (including health, well being, and income);
2. evidence for improvements in those outcomes from targeted investments in livelihood activities;
3. differences in people's mental models of livelihoods across sectors and levels.

We are addressing these questions through a stepwise process of developing a cross-cultural conceptual framework to organise data, followed by participatory modelling of the current system and future scenarios using that framework. The intent is to clarify the connections between the models and users' related experiences, categories and concepts, so the model is transparent, can be easily validated, and does not impose one cultural worldview on another.

We identified the sustainable livelihoods framework as having the handful of important

functions and interactions needed to describe land-based livelihoods. However, we have needed to modify the category definitions to match local experiences and to enable us to use analytical methods that can incorporate regional and national research data.

We found the system dynamics modelling method most closely matched the conceptual framework of end-users and the livelihood framework. More importantly, it enables us to build models that use the diverse physiological and ecological principles that are impacting human and ecological health, and to integrate qualitative and logical data. We engaged a cross-cultural reference group, and researchers working with Aboriginal communities to help develop this approach, and have used it to assess land management plans and a detailed case study.

We have found sustainable livelihoods is a useful conceptual framework for identifying important interactions among diverse variables. At finer levels of detail, we have found the challenge for participatory cross-cultural modelling is to identify key drivers that can focus diverse local strategies, guide adaptive management, and provide an argument for supportive rules across levels. The multiple levels of analysis involved may require a hierarchical set of models: a conceptual framework, a set of drivers that influence system states, and a set of outcomes that influence drivers.

This approach can help integrate scientific data and local Aboriginal efforts. It has the potential to be the basis of a tool to identify multiple types of investment that can support livelihoods as an integrated system delivering outcomes valued by local groups and the nation.

1. INTRODUCTION

Arid lands comprise 70% of the Australian continent and are home to 40,000 Aboriginal people in 1200 small towns and family settlements. Drivers including dispossession, pastoral land conversion, government policies and budget priorities have transitioned these natural-cultural systems into states very different from those long managed with Aboriginal knowledge (Rose 1995). Despite these changes, Aboriginal residents remain highly committed to sustaining the many values embodied in those lands, through arrangements such as native title and the Indigenous Protected Areas programme (HREOC 2006a, Gilligan 2006).

At the same time, Aboriginal residents have many *land-related* needs that include: respecting customary law; sustaining traditional cultural and spiritual practices; preserving languages and developing literacy including English; improving income and family wellbeing; being able to govern their local services such as health and education; and being able to influence government policies (HREOC 2006b; Anderson, Baum & Bentley 2007).

Some of these goals are shared by settler (non-Aboriginal) groups, such as conservation organizations who find important opportunities in Aboriginal lands that are in good ecological condition due in part to their economic marginality (Stafford Smith and Ash 2006). Many health, education and employment professionals are also committed to reducing entrenched disparities in their sectors.

Research on Aboriginal disadvantage has shown the co-occurrence of low assets, inadequate strategies and poor outcomes (eg. SCRGSP 2007). Correlations among many indicators of disparity across sectors (SCRGSP 2007) indicate that an integrated model for achieving land-related and other goals is necessary. Extensive cross-disciplinary data on the links among land management, education, health, income and culture have not yet been integrated into models to develop evidence-based scenarios that can be scaled-up to effective regional policies.

Local Aboriginal groups, government agencies and investors need to build a shared understanding for co-management (Rose 1995, Baker, Davies & Young 2001). An evidence-based framework to organise and model existing data can enable planning and evaluation of land management strategies. However, achieving this end must begin with a rigorous understanding of

the underlying experiences, categories, concepts and interactions across cultures and sectors.

2. METHOD

Objectives

This research is developing cross-cultural participatory models of desert Aboriginal livelihoods in land management (DK-CRC 2007). We are examining:

1. evidence for the relationship between natural and cultural resource management and sustainable livelihood outcomes for desert people including health, well being, and income;
 2. evidence for improvements in those outcomes from targeted investments in livelihood activities using innovative indicators;
- differences in people's mental models of livelihoods across cultures, sectors and levels (eg Abel, Ross and Walker 1998).

Review

Based on recommendations by consultative reports (e.g SCRGSP 2007; Anderson, Baum & Bentley 2007) and by our cross-cultural and cross-sectoral reference groups, such a framework must be able to:

- Compare cultural worldviews
- Integrate indigenous categories of experience
- Show diverse ways of having a livelihood
- Show interactions and feedback
- Accommodate institutions (rules) and agents
- Compare across diverse sites
- Enable design of an operational model
- Be understood without English literacy
- Translate among visual and story forms
- Be usable without professionals
- Be internationally validated.

The key challenge that emerges is to identify a framework that can organise data across levels of organisation: from local practices to policies across locales, based on a simple set of rules.

We reviewed frameworks for managing indigenous social-ecological systems, focusing on the cognitive hierarchy of each framework: which experiences were included in categories, which categories were included in concepts, and how concepts were linked to actions. The Sustainable Livelihood Framework (SLF) of the Institute for Development Studies (IDS 2006) shown in Figure 1 met most criteria.

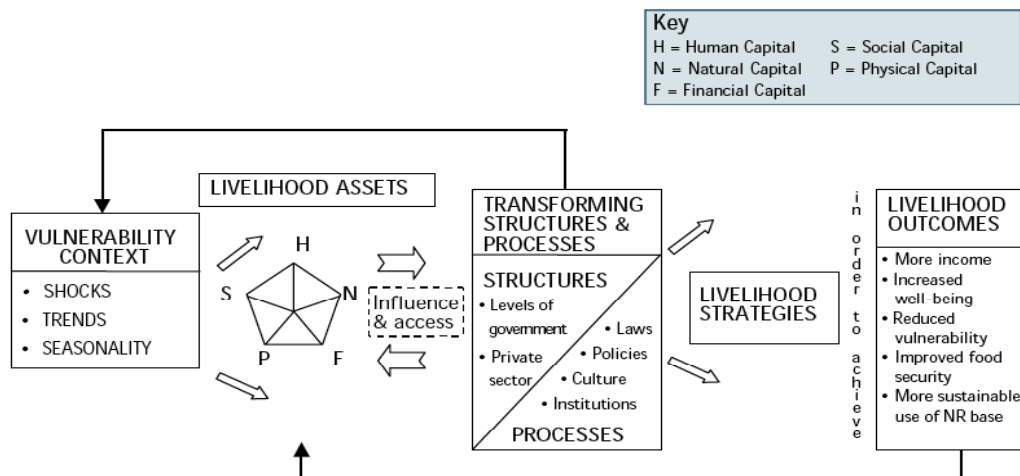


Figure 1. IDS Sustainable Livelihood Framework

Sustainable Livelihood Framework

An important strength of the SLF is that it includes only a handful of functions:

- *Assets* (as five “capitals”) enable diverse *strategies* which result in *outcomes*, and when sustained those outcomes build assets;
- *Structures and processes* affect the likelihood of successful livelihoods, and also affect how the *vulnerability context* impacts on assets;
- The ability of assets to *influence* rules is the ‘hub’ for system feedback in response to change which enables sustainability.

In over a decade of international use, the IDS diagram has often been modified by development organisations (Hussein 2002), but various versions retain all six functions. This indicates that these six are the minimum set.

Additional strengths of the SLF are: it was built around the experience of land-based peoples; it emphasises a variety of livelihoods; it accommodates processes that characterise cross-cultural conflict; it includes the importance of control/influence; it has been applied in hundreds of international settings; and it can be simplified without losing its systemic complexity.

Evaluation

A technical service provider in desert Australia used the SLF to evaluate three completed projects in Aboriginal communities (Fisher 2001). He was concerned that the SLF appeared complex and time-intensive, with measures difficult to identify. Nevertheless, Desert Knowledge CRC researchers are using it in case study research with Aboriginal communities and finding the concepts useful (Davies et al forthcoming). However, some concepts are not meaningful to participants in field settings.

We presented the SLF to our reference group. Their concerns focused on the risk of outsiders using it to impose mainstream values on Aboriginal groups, such as individualistic competition and money vs. Aboriginal values of kinship and food/shelter. However, they found the SLF as a system of relationships potentially useful for Aboriginal groups to communicate their understanding of integrated livelihoods to government, to encourage changes in rules for cross-sectoral integration. Such integration is a major challenge for government (eg. Gilligan 2006; Campbell, Davies & Wakerman 2007).

We are conducting pilot research in communities and finding it necessary to translate the SLF into a narrative format beginning with a general set of questions:

1. What are you doing that works? (Strategies, implicitly built on Assets)
2. How can you tell what works? (indicators of important Outcomes)
3. What local rules and outside policies affect what you are doing? (Rules & Influence)

These general questions can lead to more specific questions and responses that can be coded, for example:

What makes it a good day? (STRATEGY)

“Looking for goanna”

Why do you want to go out and look for goanna? (OUTCOME)

“Bush foods are good to eat”

“Exercise”

Why are bush foods good to eat? (OUTCOME INDICATOR)

“Taste good”

“Good meat”

What’s different about bush meat from shop food? (OUTCOME INDICATOR)

“Old people been living on that meat”

“We don’t like food from shop, shop food makes us sick”

“Used to eat echidna”

Why don’t you get echidna? (STRATEGY)

“We don’t go to that country, but we can”

What makes it easy to catch echidna? (STRATEGY)

“You have to know about echidna”

Do young girls know how to do this? (RULE)

“They don’t come with us”

Field assessments indicated that the SLF categories fit people’s experiences, but the conceptual framework needed to be redefined, based on categories more familiar to Aboriginal experience.

3. RESULT: A DESERT ABORIGINAL LIVELIHOOD FRAMEWORK

A useful framework must be based on concepts people commonly discuss in their own languages. This enables self-determination, promotes transparency, and can reduce misunderstanding. This transparency can also reduce the risk of outside groups with different interests abusing this model to argue against Aboriginal aspirations.

We present here a version of the SLF built on a set of general categories often presented by contemporary desert Aboriginal leaders, anthropologists, traditional owners, and researchers. They often present the central importance of land and how it is related or ‘overlaid’ with customary law, language, kinship, ceremony, spirit, plants, animals and more. This SLF variant thus begins with a redefined *asset* framework as illustrated in Figure 2, which can be modified by groups to match their own ontology.

This diagram is a simplification of more detailed frameworks, such as in the Arrernte poster, “Everything comes from the land,” (Turner 2005) the Warlpiri *ngurra-kurlu* (people in country in people) diagram (Patrick, Box & Holmes in prep), anthropological works (eg. Rose 1992, Myers 1991), native title testimony, and Aboriginal art (eg. Bardon and Bardon 2004).

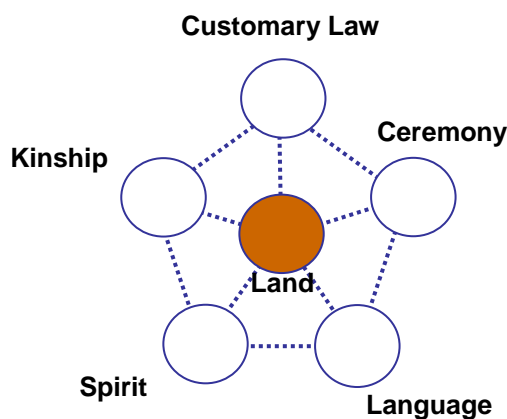


Figure 2. A generic Aboriginal asset diagram

Assets that include spirit, language and traditional law may appear to be a departure from the SLF asset categories. However, the IDS defines assets as “livelihood building blocks.” Warlpiri leader Seven Jampijinpa Patrick described some links between law and health illustrating how customary law is such a building block:

Many aspects of mainstream culture, such as grog, greed for possessions and money and such like, have tricked our people and gotten them caught up in lifestyles that are leading to tragic death. Our traditional story lights up the path that will lead us back to health as a nation, and we call this “purami.” (Patrick 2007)

As shown in Table 1, each of the IDS “capitals” in Figure 1 map to each of the asset categories in Figure 2 integrating those capitals. The intersections can also function as more tangible surrogate indicators.

Strategies and Outcomes

Reference group members and the literature point out “strategies are in assets”, meaning that in Aboriginal livelihoods the processes and outcomes are not separate. Therefore, the asset categories in Figure 2 can also conceptualise strategies and outcomes in the SLF (Figure 1), as shown by Figure 3. This further simplifies the

Table 1: An Integration of Capitals in Aboriginal Assets

	Land	Law	Language	Ceremony	Kinship
Human	Knowledge of country	People having knowledge	Amount of knowledge shared	Right people for country	Family members cared for
Social	Responsible families for land	Law taught and learned	Youth learning language	Youth become responsible adults	Strong family connections
Financial (Money)	“Ownership” of country	Having control of your future	People paid for knowledge	Payment for cultural services	Income to care for family
Physical	Roads to important places	Tools to meet responsibilities	Stories and photos recorded	Transport for country visits	Housing for family
Natural	Productivity of land	Knowledge of your country	Proper names of plants, animals	Increases in plants, animals	Regular family country visits

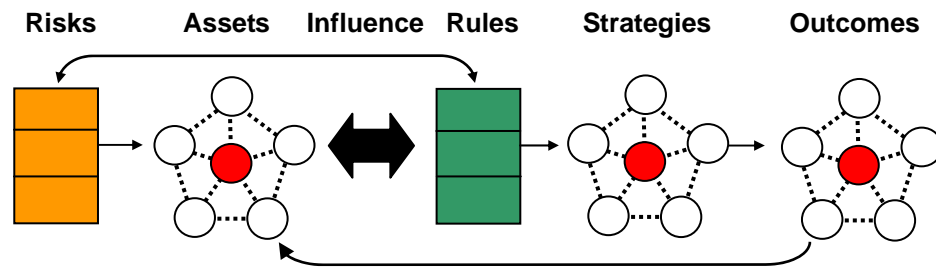


Figure 3. A desert version of the Sustainable Livelihood Framework

SLF, so that one set of categories can specify:

1. What people *have* (assets)
2. What people *do* with what they have (strategies)
3. What people *get* from what they do (outcomes)

Rules

In Figure 3 we have renamed the IDS category of Policies and Procedures as ‘Rules.’ The Institutional Analysis and Development (IAD) method (Ostrom 2005) is effective in identifying rules that have similar functions, enabling comparisons and providing transferable guidelines. This internationally-validated method analyses rules at three nested levels: Operational – the structure of day-to-day activities that impact on the world; Collective – the policies that determine those structures; and Constitutional – the laws or social contracts that define those policies (Gibson, Ostrom and Ahn 2000). This is illustrated by the three-level box in the centre of Figure 3.

Analysing rules using levels of organization enables reconciliation of Aboriginal customary law and the laws that concern government. Both sets of rules affect desert Aboriginal livelihoods. We expect that IAD analysis can help groups compare the functions of rules across cultures, and their effect on Aboriginal assets and livelihoods.

Risks

The SLF was originally designed to address the ‘context of vulnerability’ in many third-world nations, such as in sub-Saharan Africa. With little national wealth, those people are most vulnerable to environmental factors. In Australia, Aboriginal poverty is a racial disparity and risks are driven by policies of cultural assimilation (eg HREOC 2006b). The established method to analyse the disproportionate impact of policies on one group is to use triple-bottom-line risk analysis (environment-social-economic). As with rules, this is illustrated by a three-level box, on the left in Figure 3.

Influence

A desert Aboriginal framework needs to foreground influence due to the long history of Aboriginal failure to gain influence (Gardiner-Garden 1999), the literature on influence as a determinant of health (Wilkinson & Marmot 2003; Chandler & Lalonde 2000), and emerging challenges to one of the few domains in which desert Aboriginal people have had influence – land rights.

Aboriginal assets must first be valued by others if Aboriginal people are to influence the rules that govern these assets and their lives. Influence is thus the feedback ‘hub’ for modifying rules based on livelihood strategies that have been proven successful in building assets.

Using the SLF in Participatory Modelling

Participatory modelling is a familiar practice in Aboriginal societies. Paintings and stories are characterised by icon-based images of the interactions among people and other species performing important functions under specific rules. Those paintings are typically created collectively, and their meaning is clear to participants (Bardon and Bardon 2004). Contemporary Aboriginal paintings extend this visual language to model new scenarios (eg. HALT 1991). Our intent for participatory modelling (den Besten 2004) is to help people:

- access and use existing research data, eg. health statistics, ecological monitoring, and population trends;
- apply their own experiences and observations
- identify important relationships among these data types, and communicate their understanding of those relationships;
- experiment in robust ways with changes that increase the likelihood of sustainable livelihood outcomes.

The epistemologies of modelling methods were compared and system dynamics was chosen because:

- It enables dissemination of physical data on the determinants of changes in human health

biomarkers, measures of ecosystem function and other important indicators.

- It can match to the structure of Aboriginal knowledge and its emphasis on stocks, flows and causal loops, its iconography, the ontology of the SLF (Table 2), and the mix of quantitative, qualitative and logical data available for modelling.

Table 2. Comparing SLF and SD Elements

SLF Categories	System Dynamics
Assets	Stocks
Outcomes	Outflows
Strategies	Converters
Rules	Decisions
Risks	Inflows
Indicators	Parameters
Influence	Feedback

The desert version of the SLF was used to assess interactions in cross-cultural land management policies, plans and activities from the local to international levels (LaFlamme forthcoming).

Four sets of interactions were important:

- *Outcomes achieved using diverse strategies.* The ability to include Aboriginal values increased the diversity of strategies, while Aboriginal groups planned and developed strategies that integrated many sectors.
- *Rules influenced by assets.* Aboriginal knowledge has a history of contributing to mainstream science, international and national laws, and land management plans.
- *Supportive rules across levels.* A few innovative evidence-based policies showed the potential for appropriately-designed laws and policies to contribute to the sustainability of local strategies.
- *Shared understanding of livelihoods as a system.* Engagement is sustained when there is a shared understanding of both Aboriginal and mainstream frameworks.

We also analysed a natural-cultural resource management project using seven types of data that included ecological monitoring, participant interviews, focus groups and observations, project plans and budgets. The desert Aboriginal framework proved to be an effective tool to show systemic interactions. The project originated from Aboriginal elders and government staff developing rules across levels such as for training; it integrated Aboriginal and government assets, strategies and outcomes such as increases in game and endangered species; it increased art production from increased contact with country; and improved family nutrition from increased income. Application of the SLF highlighted the risk of dependence on outside funding, and a

small model demonstrated a strategy for increasing the sustainability of a local enterprise.

4. CONCLUSION

The challenges that emerge from these activities are to:

- identify how participatory models can strongly contribute to people's existing understanding of contextual interactions without becoming too complicated; and
- build a framework around desert Aboriginal people's categories that can help "put the puzzle pieces back together" (MK Turner 2007 pers. comm.) in cross-cultural interactions.

Participatory modelling can contribute by focusing diverse strategies around positive drivers that are meaningful to people who are often characterised by others in terms of perceived deficits. A modelling framework built on Aboriginal understanding that enables analysis at increasing levels of detail can be a tool to reach our objectives: equitable cross-cultural partnerships to achieve measurable improvements in outcomes from Aboriginal livelihoods in land, and to demonstrate the value of these outcomes.

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